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**BOX-LIKE CONTAINERS**
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- (56) Prior Art Documents  
**AU 50291/72**  
**AU 7084/61**  
**AU 18915/34**
- (57) Claim

1. A box erected from a blank of board material to form a base wall and side walls extending perpendicularly from the base wall, and rigid inserts for maintaining at least some of the side walls at right angles to the base wall, each of said inserts being of plate-like form of right-angled construction to provide an upright limb which co-operates with the side wall and a base limb which is held against the base wall, wherein the side walls are at least of two-layer construction with a first of said layers joined to a second of said layers by a fold line at the edge of the side wall remote from the base wall, and the upright limbs of the inserts are sandwiched between the adjacent surfaces of the first and second layers of the respective side walls.

**A U S T R A L I A**  
**PATENTS ACT 1990**  
**COMPLETE SPECIFICATION**  
**FOR A PETTY PATENT**  
**(ORIGINAL)**

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**INVENTION TITLE:** "Box-like Containers"

The following statement is a full description of this invention, including the best method of performing it known to us:

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## BOX-LIKE CONTAINERS

The present invention relates to box-like containers of the type erected by folding a blank of board-like material.

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Plastics board material is known in the form of a composite consisting of opposed sheets separated by a reinforcing core of rib-like or corrugated form with the ribs or corrugations extending in parallel directions. The overall structure consisting of the opposed sheets and reinforcing core is formed as an integral structure by an extrusion process and this is sometimes referred to as "hollow profile plastic sheet". The plastics may be a polypropylene although in an alternative it may be a polyethylene. Composite plastics board of the type in question is sold under the trade marks "CORFLUTE" (manufactured by BTR Nylex Limited of Melbourne, Victoria) and "FLUTEBOARD" (manufactured by Corex Plastics (Aust.) Pty.Ltd. of Dandenong, Victoria).

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This type of composite plastics board material has many possible uses, one application is in packaging, in the construction of boxes. Depending on the dimensions of the box and in particular the length-to-height ratio of the side walls, the side walls may tend to bow outwardly over their length. Although for many applications a slight outwards bow is of no concern, there are some applications for which an outwards bow which results in the side wall inclining to the vertical along part of its length, is not acceptable. One example of such a situation is in so-called "Solander" boxes as may be used in art galleries and libraries for packaging artworks, folios, drawings, and the like in a flat condition. It has been established that purchasers of such boxes are not usually prepared to accept a box in which the side walls are other than almost perfectly planar and upright. As a result such boxes have been, and still are, traditionally fabricated from wood with the result that the box is expensive to produce. Conventional box fabrication techniques from folded board material have not hitherto been found satisfactory for an application such as this.

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According to the invention, there is provided a box erected from a blank of board

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material to form a base wall and side walls extending perpendicularly from the base wall, and rigid inserts for maintaining at least some of the side walls at right angles to the base wall, each of said inserts being of plate-like form of right-angled construction to provide an upright limb which co-operates with the side wall and a base limb which is held against the base wall,  
5 wherein the side walls are at least of two-layer construction with a first of said layers joined to a second of said layers by a fold line at the edge of the side wall remote from the base wall, and the upright limbs of the inserts are sandwiched between the adjacent surfaces of the first and second layers of the respective side walls.

10 In a preferred embodiment the base limbs of the rigid inserts are held against the base wall by a base panel within the interior of the box and held against the base wall whereby the base limb of the insert is held by being sandwiched between adjacent surfaces of the base wall and base panel.

15 Alternatively, the base limbs of the inserts are held against the base wall by adhesive, fusion welding, or mechanical fastening means.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

20 Figure 1 is a perspective view of a primary blank for erection by folding into a box in accordance with one embodiment of the invention;

Figures 2 and 3 illustrate successive stages during the erection of the blank of Figure 1;

Figure 4 shows the erected blank and a separate base panel inserted into the blank;

25 Figure 5 is a perspective view of one of a series of rigid reinforcing plates



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incorporated during erection; and

Figure 6 is a vertical section through a side wall and adjacent part of the box to illustrate the co-operation between the reinforcing insert, the side wall, and the base.

5        Although the preferred embodiment of the invention will now be particularly described with reference to a so-called "Solander" box for art folios and the like (as discussed previously) it is to be understood that this is by way of illustrative example only and that the invention has general applicability to other packaging applications in which the side walls are required to be maintained in a strictly upright fashion throughout their length.

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As shown in Figures 1 to 4 the box is erected from a blank 2 (Figure 1) of composite plastics board material of the type discussed at the outset, to form a box body 4 and a lid 6 each comprising a base wall 8,10 and side walls 12,14, respectively. The respective side walls 12,14 of the box comprise two layers of the composite board material, the two layers  
15 being joined at their upper edges and being formed by folding an outer flap 12a,14a inwardly over an inner flap 12b,14b. In the erected box the two-layer side walls are retained in their folded state by a base panel 20 inserted into the base of the box body and lid. In order to retain the structure in its assembled state, the lower edges of the inner layers 12a,14a of at least some of the side walls are profiled to define a series of downwardly-projecting tabs and  
20 the corresponding edges of the base panel 20 are profiled with corresponding recesses. In the assembled state as shown schematically in Figure 4, the edge of the base panel 20 lies beneath the adjacent lower edge of the inner layer to be retained thereby and the tabs at the lower edge of the inner layer are retained in the recesses in the edge of the base panel to thereby retain the inner layer in its vertical condition. It will be appreciated that there is achieved in this  
25 way a mutual interlocking of the base panel with the inner layers of the side walls.

In order to maintain the side walls in a strict vertical position, reinforcing plates 22 (Figure 5) of L-shaped form are incorporated at intervals along the length of each side wall during erection of the box. The reinforcing plates 22 are constructed from a lightweight  
30 material such as an alloy or a rigid plastics. As shown in Figure 6, the vertical limb 22a of

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each plate 22 lies between the inner and outer layers of each side wall. The horizontal limb 22b of each plate 22 lies between the base wall 8 or 10 and base panel 20 in the vicinity of the junction between the inner layer of the side wall and base panel 20 so that the base panel 20 maintains the horizontal limb 22b of the plate in contact with the base wall 8 or 10 and hence ensures that the vertical limb 22a of the plate 22 is maintained perpendicular to the base wall. The vertical limb 22a of each plate 22 is tightly sandwiched between the inner and outer layers of the side walls and thereby ensures that the side wall is retained perpendicular to the base wall. It is to be understood that the number of, and positioning of, the reinforcing plates will be dependent on the length and height of the side walls. In some cases only a single reinforcing plate may be required mid-way along the wall in question, although in other cases two or more such plates may be required.

Although as described, the side walls are of two layer construction, the invention is also applicable to constructions in which the side walls consist of more than two layers, for example three or four layers.

The embodiment particularly described is advantageous in that the box can be supplied to the customer in "knock-down" state in the form of a flat blank and separate flat base panel together with the appropriate number of reinforcing plates for installation during erection by the customer.

In alternative constructions, means other than an inserted base panel can be used for maintaining the double layer side walls in their folded state and for maintaining the horizontal limbs of the reinforcing plates against the base walls. For example the side walls could be maintained in their folded state by engagement of tabs at the lower edges of the inner layers in slots formed in the base panel of the blank and the horizontal limbs of the reinforcing plates could be held against the base walls of the box body and lid by adhesive, by fusion welding,



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or by mechanical fastenings such as rivets.

Throughout this specification and claims which follow, unless the context requires otherwise, the word "comprise", or variations such as "comprises" or "comprising", will be  
5 understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

The embodiments of the invention have been described by way of example only and modifications are possible within the scope of the invention.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A box erected from a blank of board material to form a base wall and side walls extending perpendicularly from the base wall, and rigid inserts for maintaining at least some  
5 of the side walls at right angles to the base wall, each of said inserts being of plate-like form of right-angled construction to provide an upright limb which co-operates with the side wall and a base limb which is held against the base wall, wherein the side walls are at least of two-layer construction with a first of said layers joined to a second of said layers by a fold line at the edge of the side wall remote from the base wall, and the upright limbs of the inserts are  
10 sandwiched between the adjacent surfaces of the first and second layers of the respective side walls.

2. A box according to claim 1, wherein the base limbs of the rigid inserts are held against the base wall by a base panel within the interior of the box whereby the base limb of the  
15 insert is held by being sandwiched between adjacent surfaces of the base wall and base panel.

3. A box according to claim 1, wherein the base limbs of the rigid inserts are held against the base wall by adhesive, by fusion welding, or by mechanical fastening means.

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DATED this 19th day of December, 1997.

HYPE PTY.LTD.

By its Patent Attorneys:

DAVIES COLLISON CAVE

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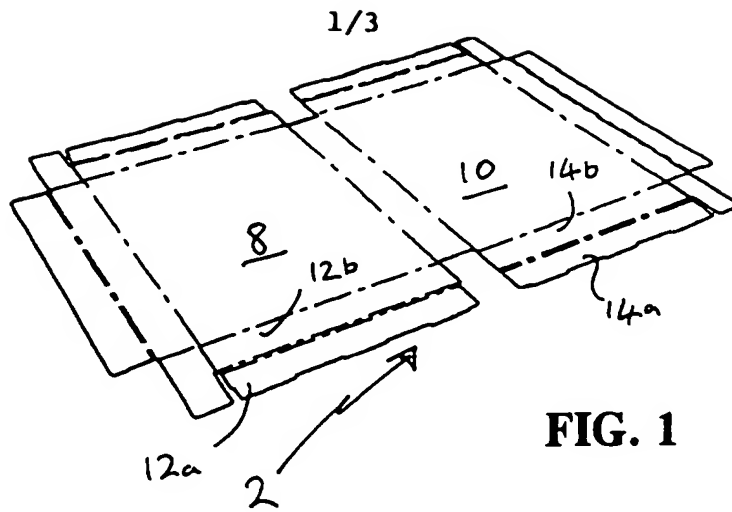




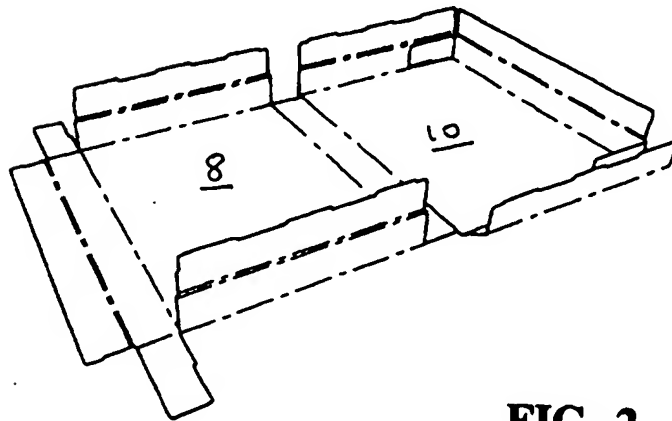
## ABSTRACT

A box erected from a blank of board material to form a base wall and side walls extending perpendicularly from the base wall. The side walls are of two-layer construction with the inner layer joined to the outer layer by a fold line at the edge of the side wall remote from the base wall. Rigid inserts are provided to maintain at least some of the side walls at right angles to the base wall, each of said inserts being of plate-like form of right-angled construction to provide an upright limb sandwiched between the adjacent surfaces of the inner and outer layers of the side wall and a base limb which is held against the base wall.

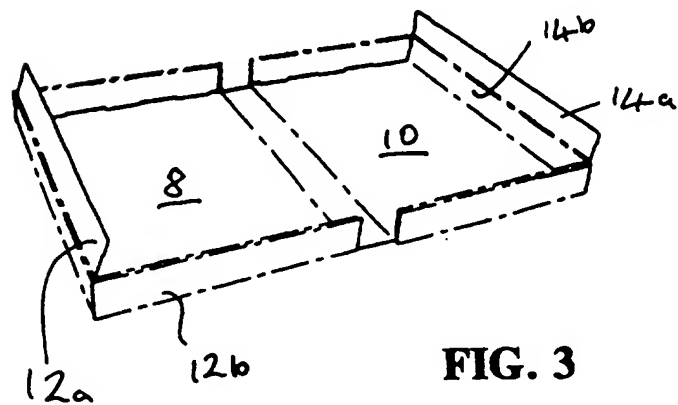
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**FIG. 1**



**FIG. 2**



**FIG. 3**

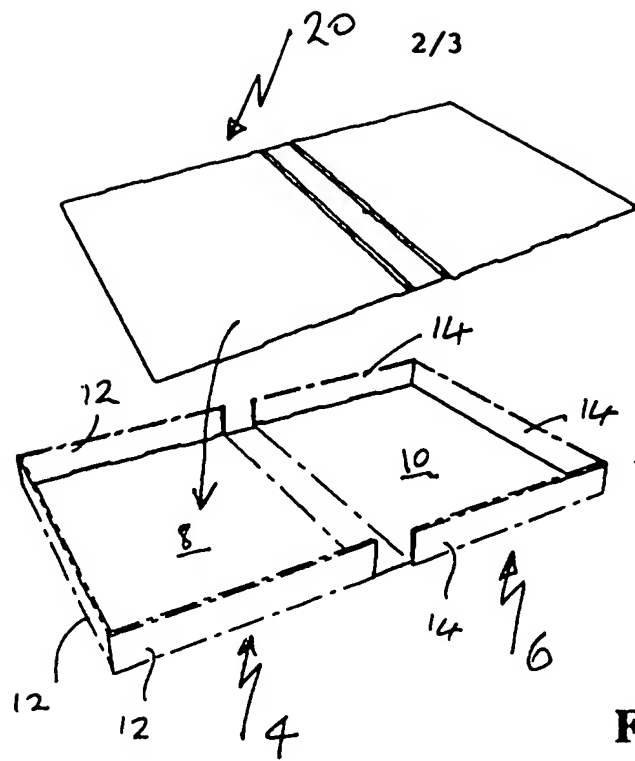


FIG. 4

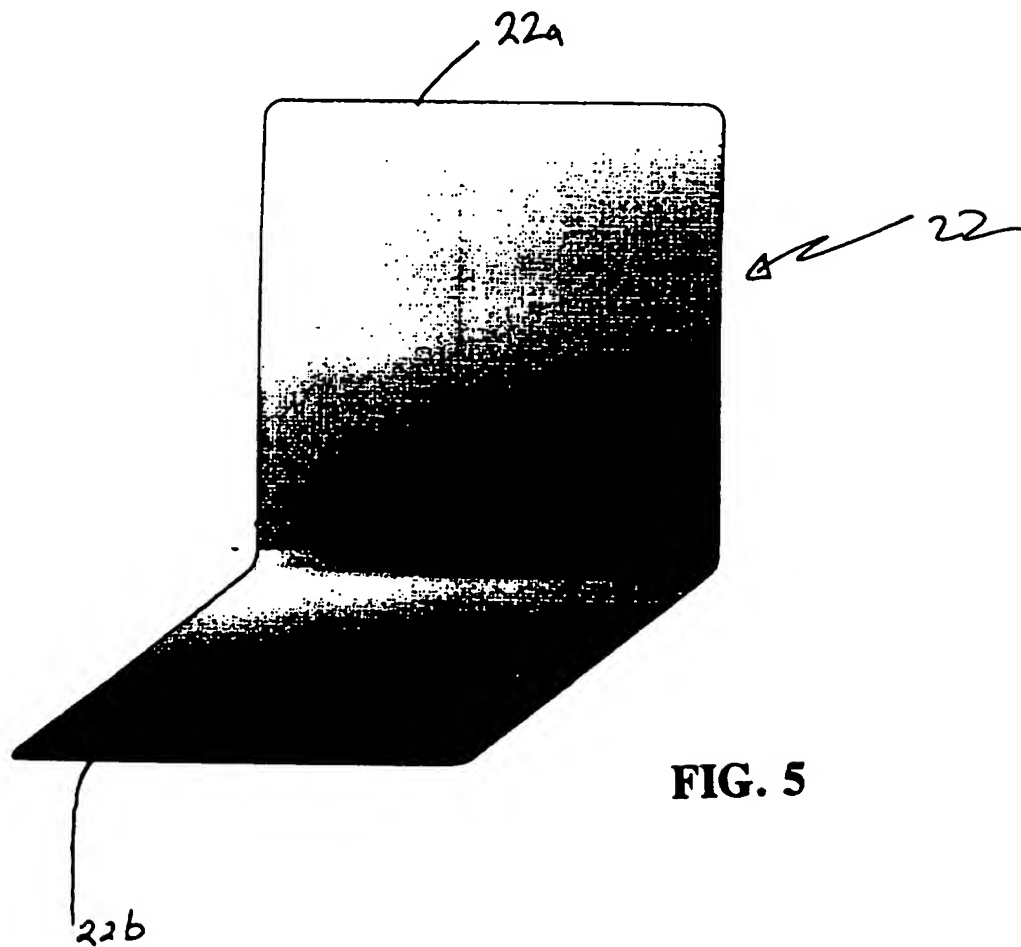
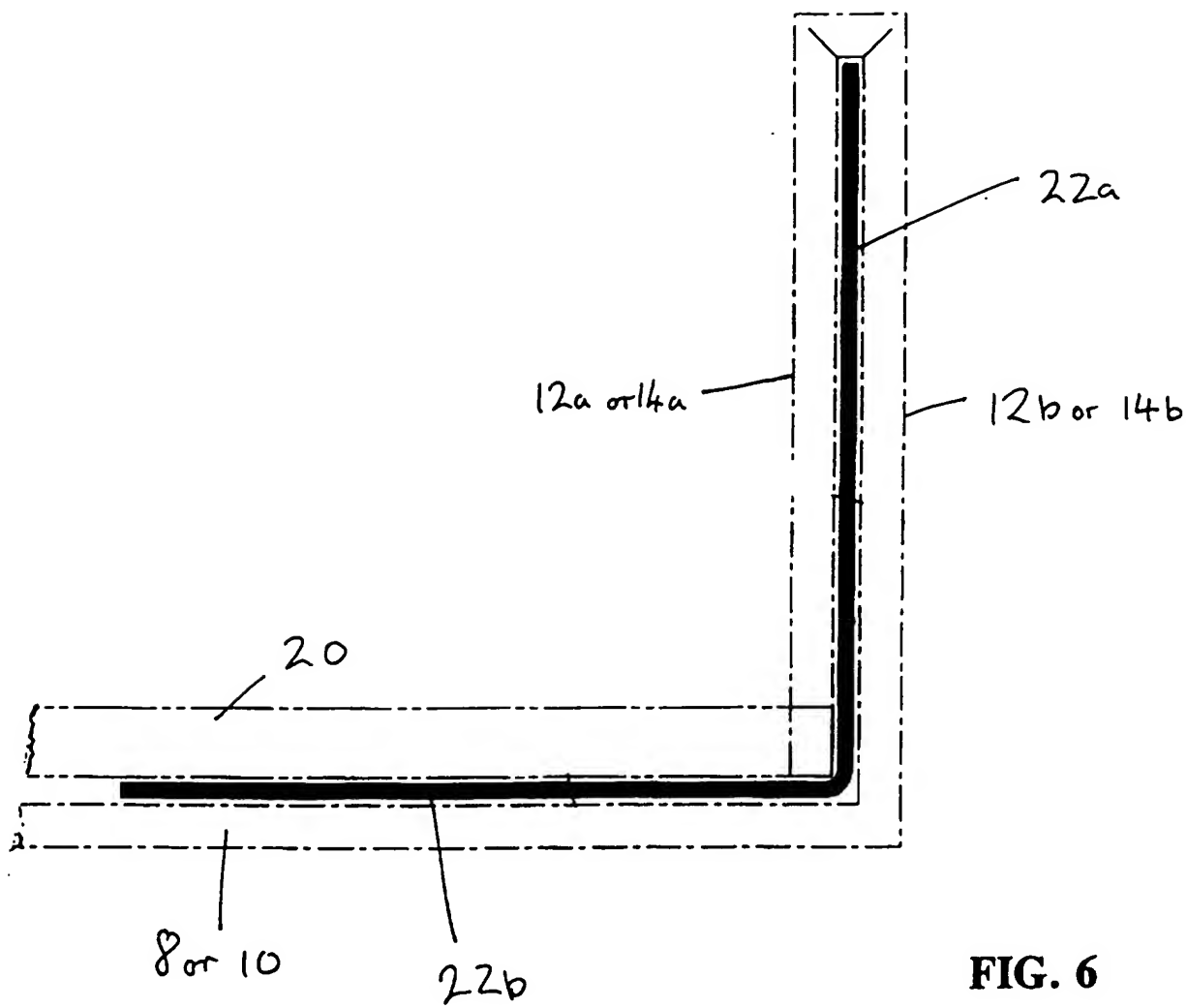


FIG. 5



**FIG. 6**